

WHAT IS CLAIMED IS:

1. A surgical microscope system for observing an eye of a patient, the surgical microscope system comprising:
 - a surgical microscope (3) having an observation beam path (24);
 - 5 a beam splitter (7) in the observation beam path; and
 - a retinal diagnostic device having a digital retinal camera (13) and a camera beam path (25) from the beam splitter (7) to the digital retinal camera (13).
- 10 2. The surgical microscope system as defined in Claim 1, wherein the retinal diagnostic device includes a retinal lens (23) in the observation beam path (24) between the beamsplitter (7) and the patient's eye.
3. The surgical microscope (3) as defined in Claim 2, wherein the retinal lens (23) directly contacts the patient's eye.
- 15 4. The surgical microscope (3) as defined in Claim 2, wherein the retinal lens (23) is spaced from the patient's eye.
5. The surgical microscope system as defined in Claim 1, further comprising means for alternately selecting a surgical microscope mode and a retinal diagnostic device mode.
- 20 6. The surgical microscope system as defined in Claim 1, further comprising a light guide (16) for transscleral retinal illumination.
7. The surgical microscope system as defined in Claim 6, further comprising an illumination source (15) connected at least to the light guide (16), wherein the illumination source (15) includes at least two color diodes.

8. The surgical microscope system as defined in Claim 7, wherein the illumination source (15) is a stroboscopic illumination source.
9. The surgical microscope system as defined in Claim 1, further comprising an imaging system (30) in the camera beam path (25), the imaging system (30) having adjustable lenses or lens groups (12, 12a).
10. The surgical microscope system as defined in Claim 9, further comprising an illumination source (15) including at least two color diodes, wherein the imaging system (30) provides chromatic correction for the wavelengths of the at least two color diodes of the illumination source (15).
11. The surgical microscope system as defined in Claim 10, wherein the imaging system (30) includes diffractive elements and conventional lenses.
12. The surgical microscope system as defined in Claim 1, wherein the digital retinal camera (13) comprises a CCD array having a plurality of pixels in a common plane, and the beam profile leaving the imaging system (30) is oriented substantially perpendicularly onto the plane of the pixels of the CCD array.
13. The surgical microscope system as defined in Claim 2, wherein the surgical microscope (3) includes a main objective (4) in the observation beam path (24), and the retinal lens (23) is movable into and out of the observation beam path (24) at a location between the main objective (4) and the patient's eye.
14. The surgical microscope system as defined in Claim 13, further comprising a pivoting-in apparatus (21) carrying the retinal lens (23), whereby the retinal lens (23) can be pivoted into and out of the observation beam path (24).
15. The surgical microscope system as defined in Claim 1, wherein the surgical microscope (3) is a surgical stereomicroscope.

16. The surgical microscope system as defined in Claim 13, further comprising a beam transposer (11) movable into and out of the observation beam path (24) at a location between the main objective (4) and the patient's eye.
- 5 17. The surgical microscope system as defined in Claim 16, further comprising a pivoting-in apparatus (21) carrying the retinal lens (23) and the beam transposer (11), whereby the retinal lens (23) and the beam transposer (11) can be pivoted into and out of the observation beam path (24).
- 10 18. The surgical microscope system according to Claim 16, further comprising an auxiliary lens (28) movable into and out of the observation beam path (24) at a location between the main objective (4) and the patient's eye.
- 15 19. The surgical microscope system as defined in Claim 18, further comprising a pivoting-in apparatus (21) carrying the retinal lens (23), the beam transposer (11), and the auxiliary lens (28), whereby the retinal lens (23) the beam transposer (11), and the auxiliary lens (28) can be pivoted into and out of the observation beam path (24).
- 20 20. The surgical microscope system as defined in Claim 1, further comprising microscope illumination system (8) associated with the surgical microscope (3), wherein the microscope illumination system (8) can be switched off during operation of the digital retinal camera (13).
21. The surgical microscope system as defined in Claim 7, further comprising a computer (17) connected to the illumination source (15), wherein the illumination source (15) can be switched on automatically, under the control of a computer (17), upon image acquisition by the digital retinal camera (13).

22. The surgical microscope (3) as defined in Claim 8, wherein the pulse frequency of the illumination source (15) lies above the flicker limit of an observer's eye (6).

5 23. A surgical microscope system for observing an eye of a patient, the surgical microscope system comprising:

a surgical microscope (3) having an observation beam path (24);

a beam splitter (7) in the observation beam path;

10 a retinal diagnostic device having a digital retinal camera (13) and a camera beam path (25) from the beam splitter (7) to the digital retinal camera (13);

a microscope illumination system (8) associated with the surgical microscope (3);

a first light guide (16) arranged to provide transscleral retinal illumination;

15 an illumination source (15) connected to the microscope illumination system (8) and to the first light guide (16) to selectably provide illumination light to either of the microscope illumination system (8) and the first light guide (16).

20 24. The surgical microscope system as defined in Claim 23, further comprising:

a second light guide (9) arranged to deliver light to the microscope illumination system (8); and

25 an optical light branching switch (31) connecting the first light guide (16) and the second light guide (9) to the illumination source (15), whereby light from the illumination source (15) can be switched between the first light guide (16) for use in transscleral retinal illumination and the second light guide (9) for use in microscope illumination system (8).

25. The surgical microscope system as defined in Claim 24, further comprising a computer (17) connected to the optical light branching switch (31) for controlling the optical light branching switch (31).
- 5 26. The surgical microscope system as defined in Claim 25, wherein the surgical microscope (3) includes a main objective (4) in the observation beam path (24) and the retinal diagnostic device includes a retinal lens (23), a beam transposer (11), and an auxiliary lens (28) movable into and out of the observation beam path (24) between the main objective (4) and the patient's eye, wherein the retinal lens (23), the beam transposer (11), and the auxiliary lens (28) are carried
10 into and out of the observation beam path (24) by a mechanism (21) controlled by computer (17).
27. A surgical microscope system for observing an eye of a patient, the surgical microscope system comprising:
15 a surgical microscope (3) having an observation beam path (24) and a stereo tube (5) on the observation beam path (24);
a beam splitter (7) spaced from the stereo tube (5) in the observation beam path (24); and
20 a retinal diagnostic device having a digital retinal camera (13) and a camera beam path (25) from the beam splitter (7) to the digital retinal camera (13), the retinal diagnostic device further having a beam transposer (11) removably installed in the observation beam path (24) between the stereo tube (5) and the beam splitter (7).
28. The surgical microscope system as defined in Claim 27, wherein further comprising a computer (17) for controlling installation of the transposer (11) in
25 the observation beam path (24).